

ABSTRACT OF THE DISCLOSURE

An EGR-gas temperature estimation apparatus for an internal combustion engine which has an exhaust circulation pipe and an EGR-gas cooling apparatus. The estimation apparatus obtains the cooling efficiency η_{egr} of the EGR-gas cooling apparatus from the temperature T_{ex} of EGR gas at the inlet of the exhaust circulation pipe and the flow rate G_{egr} of the EGR gas, and obtains the temperature T_{HW} of engine cooling water, used as a coolant for the EGR-gas cooling apparatus. Subsequently, the estimation apparatus calculates the temperature T_{egr} of the EGR gas at the outlet of the exhaust circulation pipe by the expression $T_{\text{egr}} = T_{\text{ex}} - \eta_{\text{egr}} \cdot (T_{\text{ex}} - T_{\text{HW}})$. Since the cooling efficiency η_{egr} greatly changes depending on the EGR-gas flow rate G_{egr} and the EGR-gas temperature T_{ex} , the estimation apparatus can accurately estimate the cooling efficiency η_{egr} , and therefore can accurately estimate the EGR-gas temperature T_{egr} .